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WELL DEVELOPMENTS

No. 18 Board of Water Well Contractors February 1997

Board Members

Wes Lindsay - Chairman / Industry Member
Laurence Siroky - DNRC Member
John Arrigo - DEQ Member
Bob Bergantino - MBMG Member
Pat Byrne - Industry Member
Bob Rudio - Program Manager

CURRENT BOARD MEETINGS

The regular session of the Board of Water Well Contractors was held on February 7, 1997, in the DNRC Library, Helena, Montana. The board reviewed proposed legislation including HB166, which could limit the board's use of forfeited bonds, and HB132, which would require additional reporting of enforcement procedures to the EQC. The board reviewed the current funding balances provided by DNRC's Fiscal Bureau and current cost increases due to inflation, unexpected moving costs, and new rule preparations. The board also discussed changes to the water well log report form and ageed to work with DNRC to make proposed changes to the form. Finally, the board reviewed the rule notice for the Yellowstone Controlled Groundwater Area.

APPOINTMENT TO THE BOARD

DNRC Director Bud Clinch has appointed Laurence Siroky to replace retiring member Ron Guse for a three-year term on the Board of Water Well Contractors (BWWC). Siroky is a 27-year veteran of DNRC. He currently is chief of the Water Operations Bureau of DNRC's Water Resources Division and has also served as chief of the Water Rights Bureau. Siroky brings experience not only with wells, but also with water resources engineering, water rights, water projects, and dams.

Photo by Jim Bond

Laurence Siroky

CONTINUING EDUCATION

The Montana Environmental Training Center (METC) has prepared its training calendar for 1997, and BWWC has recommended several courses that qualify as approved training for water well licensees. They are as follows:

Groundwater under the Direct Influence of Surface Water and Sanitary Surveys

January 9, 1997	Missoula	Ruby's Reserve St. Inn	4825 North Reserve
February 4, 1997	Great Falls	MSU-Northern	1211 Northwest Bypass
February 27, 1997	Billings	Clarion Inn	1223 Mullowney Lane

Advanced Surface Water Treatment: System Optimization

January 15, 1997	Great Falls	MSU-Northern	1211 Northwest Bypass
February 26, 1997	Billings	Water Treatment Plant	2251 Belknap Avenue

Hazardous Materials Safety

January 22, 1997	Bozeman	Holiday Inn	5 Baxter Lane

Multiple Topic Training Session for Water and Wastewater Professionals

February 19-20, 1997	Butte	Copper King	4655 Harrison Avenue South
May 14-15, 1997	Miles City	Eagles Club	28 North Eighth

Safety in Water and Wastewater

April 10,1997	Scobey	Nemont Friendship Room	2 Railroad Avenue

Chlorination

April 15, 1997	Boulder	Pending	Pending
April 17, 1997	Missoula	Pending	Pending

Basic Groundwater Systems

April 17, 1997	Kalispell	Wastewater Treatment Plant	2001 Airport Road
June 26,1997 (New)	Lolo	Pending	Pending

Pumps and Motors

May 20, 1997	Glasgow	Pending	Pending
May 22, 1997	Cut Bank	Pending	Pending

Dealing With Coliforms

June 5, 1997	Butte	Copper King	4655 Harrison Avenue South

Small Water and Wastewater System Session

June 18-19, 1997	Glendive	Best Western Holiday Lodge	223 North Merrill Avenue

Source Water Protection

June 25, 1997	Lolo	Community Center	12345 Highway 93 South

For additional information or registration, call Jan Boyle or Barb Coffman at 406-454-2728. The Northwest Pipe Vendor Fair is scheduled for May 29 and 30 in Billings; contact Denny at 1-800-937-4737. The Gould Pump school has been scheduled for Billings on March 6, 1997; you may contact Mitch or Chuck at 1-800-893-1003. Further suppliers' courses and local mud and pump schools will be scheduled in March, April, and May 1997.

HELPFUL HINTS FOR NEW DRILLERS

Water Witching

On occasion, you will be asked to drill exactly where an owner had the well witched. It doesn't help either to argue or to agree. Your basic job is to drill where the owner wants, because the well location is, within limits, his responsibility. The limits are basically safety from utilities and state requirements for maintaining distances from septic tanks, sewer lines, etc. Drillers can get into trouble when there is not enough water or the well is dry. Don't compound the problem by arguing about water witching or by promising water. Remember, your responsibility is to drill the hole properly and develop the water that you encounter.

Mixing Cuttings with Bentonite

In the good old days, drillers used anything from mud to inner tubes and rags to keep the hole from caving and keep circulation until the casing was set. Bentonite was often mixed with anything, including drill cuttings, because it was commonly used in the oil fields and with mud rotary rigs. Older, experienced drillers still want to use a mix of cuttings and bentonite to seal the upper 18 feet of a water well or to puddle the mix behind driven casing. However, Montana's rules prohibit mixing cuttings with bentonite.

Why? Because, during the 1980s, much testing of sealants was done. The results were variable, but seemed to indicate that, although neither neat cement nor pure bentonite was perfect, they were indeed the best under most circumstances. Recent testing indicates that mixing cuttings with bentonite does not substantially affect hydration and sealing; however, under certain high pH and temperature conditions, bentonite does not hydrate effectively, particularly to shut out hydrocarbons.

So, there is no sealant that is best under all conditions. Pursuant to rule 36.21.634(33), you are required to use a pure sealant of bentonite clay grout or neat cement grout.

Well Log Report Forms

Montana maintains a well log database at the Montana Bureau of Mines and Geology (MBMG) in Butte. Your driller fees helped pay for the program. The program provides information for everyone, including drillers, on aquifers, water quantity, water quality, dry wells, abandoned wells, monitoring wells, and well locations.

You can obtain blank well log forms at any water resources regional office of the Department of Natural Resources and Conservation (DNRC). Montana law requires that a completed log be submitted to the nearest DNRC regional office within 60 days after completion of a well. There, the log is matched to the DNRC water rights database and used to fill out the proper water right forms by the well owner. A monitoring well log can be made up from the standard well log report form or from your own log form, as long as it includes the proper information. The completed monitoring well log is sent directly to the BWWC office in Helena. Logs for abandoned wells must also be filed with DNRC. All logs end up in Butte on the statewide MBMG database.

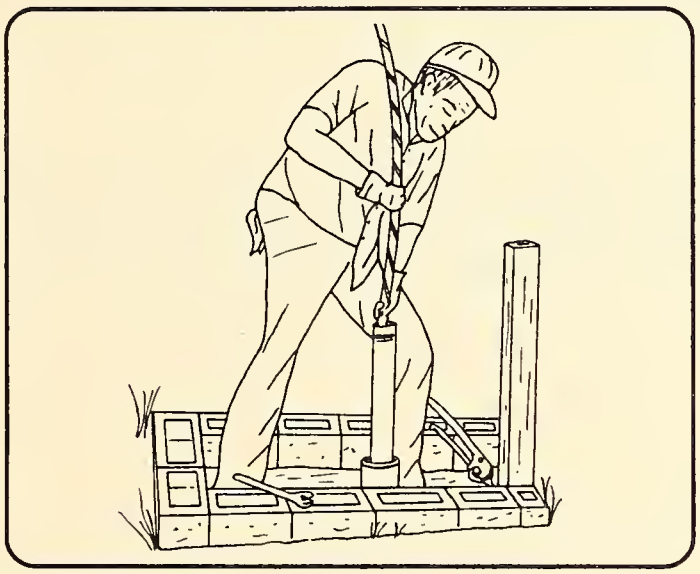
In 1988, BWWC began to place licensees on probation and suspend licenses for failure to submit correct well logs within 60 days. The reason for this policy is not only that the law requires it, but also that the log is the legal record of the work done. It also provides valuable information for anyone involved with well drilling and groundwater development. BWWC has suggested changes to the well log to eliminate a number of blank lines that don't apply.

Public Wells

A "*public water supply system*" supplies at least 15 service connections or regularly serves at least 25 persons daily for a period of at least 60 days per year. The Department of Environmental Quality (DEQ) has adopted specific and stringent standards for public wells as well as monitoring wells at landfills. The BWWC rules are minimum standards that apply to all wells, public or private. If you are going to drill a well for a church, a restaurant, etc., you need to check with DEQ to see what additional standards may be required.

Casing

Rule 36.21.641A requires that all wells be completely cased to the bottom of the usable drill hole. Drillers that routinely drive steel casing into known local aquifers at always about the same depth often forget that, in different drilling conditions, sometimes the only way to case to the bottom is to use a liner inside the steel casing. In using plastic casing for liners, follow rule 36.21.645, and also be aware that glued joints can emit an explosive gas that can be ignited by welding sparks that drop into the drill hole. Plastic screwed joints are available, as well as steel liners that can be welded.



Special Sealing Rule

The special sealing rules (36.21.655 - 660) were an attempt to cover most conditions that are encountered. Obviously, no rule can cover every situation, and BWWC has found that requiring the special rules can place the driller in a situation where he cannot know how to seal the hole properly until after he is done drilling.

The recent rule changes made these special rules recommendations, rather than mandatory requirements. It was decided to leave the rules and figures as examples that may be required by BWWC, because in some situations BWWC may need to order special sealing of a well.

Dry Holes

The average family uses 5 to 7 gallons per minute (gpm) of water. Add a garden and a lawn, and use increases to about 8 to 10 gpm. A comfortable water yield, if it is sustainable, is 12 gpm. Lending institutions may require a yield of 4 to 5 gpm for the property to qualify for a mortgage. A well yielding 1½ to 2 gpm can be developed for minimal use by building a cistern for storage. Deeper wells can also store water for use during time of higher demand.

BWWC has found that complaints often center around a promise by the driller that there will be enough water, but it turns out that the water is not sufficient. Montana regulations require that, after you surge and clean the well, you bail or pump for a minimum of one hour. This only indicates that the well is likely to be sustainable. By pump testing the well until drawdown can be measured, the prudent well owner will know better how the well will sustain pumping. Many variables, from geologic conditions to cyclic precipitation changes, can affect recharge, so there is no set rule to go by.

BWWC recommends that you follow the procedures in the rules and inform the well owner that he or she would be wise to do more pump testing.

Complaints

Everyone gets complaints. BWWC receives nearly 300 complaints annually, ranging from drillers using foul language or destroying a lawn to actual well construction violations. If you can't satisfy the well owner and it looks like trouble, it is wise to inform the BWWC office as to the nature of the complaint, so that it is not a total surprise. BWWC can likely resolve the complaint before it gets to be a personal vendetta.

Most complaints occur because of a financial misunderstanding. The board does not and cannot interfere in those business dealings. The board does get involved, however, if the allegation is about improper well construction methods.

Be Careful What You Say

Licensed drillers often forget they work for a bonded water well contractor. At times they tend to be too confident in what they say to a well owner. This leads to misunderstandings regarding both financial agreements and well construction. BWWC receives many complaints because "the guy on the rig said that we would get good water at so many feet." Contractors need to make sure their drillers do not offer unsubstantiated opinions.

Artesian Wells

Nearly all water wells are under some pressure after drilling and could be termed "*artesian wells.*" "*Flowing wells*" are simply artesian wells that have enough pressure for water to flow out of the top of the casing. You are required to control a flowing well, which means capping it and installing a shutoff valve to completely shut it off. If it flows around the casing, you must pressure grout it until it is controlled or stops flowing. This is not easy and usually is a trial-and-error procedure. You can pressure grout inside the casing or blow a hole down outside the outer casing with air and water before grouting. You can use different setting ingredients with the grout. Cement grout

usually works best with some quick set gels calcium or products recommended by manufacturers. Plugs set above the flowing zone are often used. In any event, you must control the flow, and thereafter it is up to the well owner to work out the amount of the beneficial use with the DNRC regional office.

DISINFECTION

Rule 36.21.662, about disinfection, states:

(1) Sand and gravel used in filter pack wells shall be thoroughly hosed or sluiced with water, and shall be disinfected with a solution containing at least 50 parts per million chlorine before being placed in the well. All water introduced into a well during construction shall be clean and potable. The well and its equipment, including the interior of the well casing, shall be thoroughly swabbed and cleaned to remove all oil, grease, and foreign substances upon completion of the well's construction. Following the completion of a well, and again after the pumping equipment has been installed, a well and its equipment shall be disinfected by thoroughly agitating and mixing in the well a solution containing enough chlorine to leave a residual of 25 parts per million throughout the well after a period of 24 hours.

(2) The responsibility for the chlorination of the well shall be agreed upon in writing by the parties to the drilling agreement.

(3) The contractor shall clean and disinfect the drilling equipment after drilling in an area of known or suspected contamination or areas of iron bacteria problems.

CAN BWWC HELP YOU?

Do not underestimate the assistance available from the Board of Water Well Contractors. It is far more than a regulatory body. The board has expertise from the drilling industry, both statewide and nationwide. The board also understands that a driller can get into situations that are very difficult to drill, develop, or fix properly. When a driller calls the board and says he has a problem, the board can likely recommend a way to prevent a complaint, protect the aquifer, protect the well owner, and also protect the driller. A simple phone call asking for assistance puts the uncertainty at rest and will likely head off a complaint before it becomes a big problem.

DEEP-HOLING

"***Deep-holing***" is a term that means the driller drilled deeper than necessary to develop the water. Well owners often notice that the water level in the well rises to a higher level than the log indicates, and some may assume that the driller could have quit sooner and saved the well owner costs per foot. It is wise for the driller to know something about the depth of the aquifer and the depths of neighboring wells. He should advise the well owner that there is no guarantee that he will get water at that known depth because the aquifer does not always behave predictably. Further, water in aquifers is usually confined to an unknown degree and may rise in the hole after the aquifer is penetrated. Also there is no way to know whether the water is contaminated until it is tested. The board has investigated many complaints of deep-holing. It generally considers 10 to 15 feet below the penetrated aquifer to be a reasonable reservoir, so that the pump could be lowered if necessary in cyclic dry periods. If the hole is deeper, it is suspect to deep-holing and could be termed driller error, requiring board action.

SUMMARY OF RULES CHANGES

Rule 36.21.415 Fee Schedule - Allows a fee to be charged to inspect wells that are drilled by owners on their own property. Fees are limited to travel and per diem costs.

Rule 36.21.634 Definitions - Now defines a public water supply system as "*a system that has at least 15 service connections or regularly services at least 25 persons daily for at least 60 days per year.*"

Rule 36.21.638 Location of Wells - Provides that water wells shall not be located within 50 feet of septic tanks, storage tanks, or associated lines; also, not within 100 feet of drain fields, pits, cesspools, or treatment systems.

Rule 36.21.645 Plastic Casing - Requires a minimum of 4 feet (rather than 8 feet) of overlap when a smaller plastic casing is being installed on the inside of a steel casing.

Rule 36.21.647 Top Terminal Height - Provides that casing shall extend 18 inches above the established 100-year floodplain elevation or be capped with watertight seal and vented above the flood level.

Rule 36.21.650 Casing Perforations - Clarifies that, in perforating casing, interflow between aquifers is not permitted where interflow causes deleterious effects.

Rule 36.21.654 Sealing of Casing - Provides that the rules for special sealing be examples of what may be required.

Rule 36.21.655 through 660 Consolidated Formations - Provides examples of what may be required in special sealing circumstances as determined by the board, and makes minor changes in those examples.

Rule 36.21.669A Types of Wells Requiring Abandonment - Clarifies the responsibility for abandoning various types of wells, and requires the driller to properly abandon a well within 60 days if the well is faulty because of driller error.

Rule 36.21.670 Permanent Abandonment - Clarifies the abandonment procedure so that the sealant is introduced to within 3 feet of the surface, and specifies casing removal.

Rule 36.21.677 Method of Placement of Concrete or Cement Grout - Removes the requirement for placing cement grout to within 6 feet of the surface, followed by bentonite to 3 feet from the surface, and specifies avoiding segregation or dilution.

New booklets containing the statutes and administrative rules regulating water well drilling and construction standards will be mailed to each licensee within the next couple of months.

HISTORICAL BOARD MEETINGS

The twenty-third meeting of the Water Well Contractors Examining Board was held on December 12, 1967, in Room 124 of the State Capitol Building, Helena, Montana. William Osborne was appointed by the governor to replace Mr. Van Dyken. Mr. Darlinton replaced Mr. McDermott. Mr. Hardy, state license inspector, reported that he had traveled 8,425 miles, contacted 56 drillers, and found 14 rigs that were not properly identified by sign. Mr. Darlinton made a motion that the board set up a system of licensing on the state data processing system. The motion was seconded by William Osborne and passed by voice vote. C. W. Brinck was unanimously elected chairman of the board, and Mr. Osborne was elected vice chairman. The board received complaints against Mr. C. W. Parrent, doing business as Vista Drilling Company. A letter was being prepared by Mr. Sternhagen of the Attorney General's Office to be sent to Mr. Parrent.

For further information on any of the material contained herein, contact:

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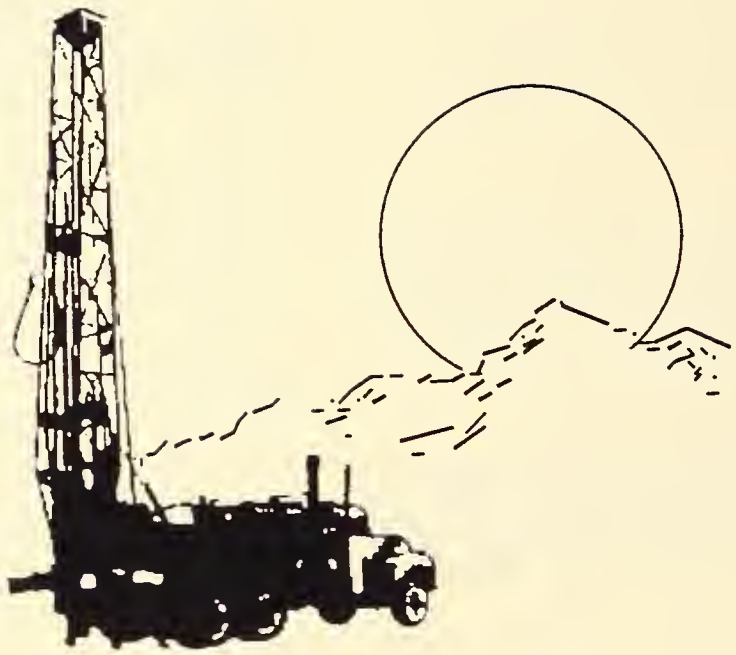

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